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Earnings Losses of Displaced Workers: Canadian Evidence from a Large Administrative Database on Firm Closures and Mass Layoffs

By René Morissette, Xuelin Zhang and Marc Frenette

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Abstract

Using Statistics Canada's Longitudinal Worker File, we document short-term and long-term earnings losses for a large (10%) sample of Canadian workers who lost their job through firm closures or mass layoffs during the late 1980s and the 1990s. Our use of a nationally representative sample allows us to examine how earnings losses vary across age groups, gender, industries and firms of different sizes. Furthermore, we conduct separate analyses for workers displaced only through firm closures and for a broader sample displaced either through firm closures or mass layoffs. Our main finding is that while the long-term earnings losses experienced on average by workers who are displaced through firm closures or mass layoffs are important, those experienced by displaced workers with considerable seniority appear to be even more substantial. Consistent with findings from the United States by Jacobson, Lalonde and Sullivan (1993), high-seniority displaced men experience long-term earnings losses that represent between 18% and 35% of their pre-displacement earnings. For their female counterparts, the corresponding estimates vary between 24% and 35%.

Keywords: Layoffs; Job Losses; Employment; Worker Displacement; Earnings Losses.

Executive summary

What is the magnitude of earnings losses that Canadian workers suffer several years after being displaced? The answer to this question is currently unknown. Several of the previous studies are based on U.S. data and have shown that, even five years after displacement, displaced workers still suffer substantial earnings losses. However, most of the evidence offered is based either on a sub-sample of high-tenure workers in a specific region or on relatively small samples drawn from the Panel Study of Income Dynamics. Furthermore, the evidence presented is not recent since it covers either the early to mid-1980s or the early 1990s. Canadian studies of worker displacement have compared pre-displacement wages to wages observed shortly after displacement but have been unable to quantify the magnitude of the earnings losses suffered several years after displacement.

The goal of this paper is to fill this gap and to quantify the earnings losses experienced up to five years after displacement by Canadian workers who lost their job during the late 1980s and the 1990s as a result of firm closures or mass layoffs. To do so, we take advantage of Statistics Canada's Longitudinal Worker File, a unique administrative data set that tracks a large (10%) sample of Canadian workers throughout the 1983 to 2002 period.

Quantifying the earnings losses that Canadian workers experience several years after displacement is important for several reasons. First, Canada's Employment Insurance program covers unemployed workers up to one year but the earnings losses suffered by many Canadian displaced workers might well extend beyond that one-year period. Since: a) displaced workers bear a disproportionate share of the costs of resource reallocation that the Canadian economy experiences due to technological changes, growth in international trade and changes in consumers' preferences; and b) such resource reallocation is generally thought to be productivity-enhancing, assessing the magnitude of the earnings losses experienced after the first post-displacement year is a prerequisite for the design of policies, if any, aimed at compensating these workers.

Second, earnings losses that extend over a one-year period likely affect the well-being of Canadian displaced workers in numerous ways. They may signal the loss of: a) rents due to union coverage or employment in large firms, b) important firm-specific skills or industry-specific skills or c) good job matches. All of these factors likely imply a permanent drop in workers' earnings. Since they are not fully compensated by increases in wives' labour supply, longer-term earnings losses of displaced workers may affect the stability of family earnings, thereby potentially influencing the consumption patterns of families affected by displacement.

Our main finding is that while the long-term earnings losses (i.e., those suffered five years after displacement) experienced, on average, by workers who are displaced through firm closures or mass layoffs are important, those experienced by displaced workers with considerable seniority appear to be even more substantial. Consistent with findings from the United States by Jacobson, Lalonde and Sullivan (1993), high-seniority displaced men experience long-term earnings losses that represent between 18% and 35% of their pre-displacement earnings. For their female counterparts, the corresponding estimates vary between 24% and 35%.

I. Introduction

What is the magnitude of the long-term earnings losses that Canadian workers suffer as a result of displacement? Since most of the evidence offered to date on this issue is based on U.S. data, the answer to this important question is currently unknown. Previous U.S. studies have shown that displaced workers suffer substantial and persistent earnings losses. However, most of the evidence offered is based either on a specific region (e.g., Pennsylvania in Jacobson, Lalonde and Sullivan, 1993) or on relatively small samples drawn from the Panel Study of Income Dynamics (Ruhm, 1991; Stevens, 1997). Furthermore, the evidence presented is not recent since it covers either the early to mid-1980s or the early 1990s.

In this paper, we fill this gap and document the short-term and long-term earnings losses experienced by Canadian workers who lost their job as a result of displacement that occurred during the late 1980s and the 1990s. To do so, we take advantage of Statistics Canada's Longitudinal Worker File, a unique data set that tracks a large (10%) sample of Canadian workers throughout the 1983 to 2002 period.

Quantifying the earnings losses of Canadian displaced workers is important for several reasons. High earnings losses may signal the loss of important firm-specific skills or industry-specific skills and/or good job matches (Jacobson, Lalonde and Sullivan, 1993), which in turn may imply a permanent drop in workers' earnings. Since they are not fully compensated by increases in wives' labour supply (Stephens, 2002), they imply high instability of family earnings, thereby potentially influencing the consumption patterns of families affected by displacement (Gruber, 1997; Browning and Crossley, 2001). They may create stress and anxiety for displaced workers, reduce their sense of control over their lives and potentially increase their vulnerability to mental health problems in the longer run (Hamilton et al., 1997). They may increase chances of family dissolution (Charles and Stephens, 2004), thereby affecting family members' well-being in an important way. Finally, they may substantially affect the retirement income of workers laid-off from companies offering defined-benefit registered pension plans whose benefits cannot be transferred to other plans elsewhere in the economy.

Arguably, policy makers might also be interested in understanding how job loss affects workers' employment income in the longer run. Since: a) Canada's Employment Insurance program covers unemployed workers up to one year, b) displaced workers bear a disproportionate share of the costs of resource reallocation that the Canadian economy experiences due to technological changes, growth in international trade and changes in consumers' preferences, and c) such resource reallocation is generally thought to be productivity-enhancing, assessing the magnitude of the earnings losses experienced after the first post-displacement year is a prerequisite for the design of policies, if any, aimed at compensating these workers.

While our main contribution is to provide Canadian evidence on the long-term costs of worker displacement, we refine previous work on worker displacement in several ways. First, previous U.S. studies of worker displacement have been unable to exclude from their samples individuals who voluntarily quit their job (Jacobson, Lalonde and Sullivan, 1993) and/or those who have been fired due to bad performance (Ruhm, 1991; Stevens, 1997). To overcome this limitation, some have relied on a sample of workers who separated from their employer as a result of mass layoffs (Jacobson, Lalonde and Sullivan, 1993). In contrast, the data set we use in this study

allows us not only to separate quits, layoffs and other types of separations, but also to identify permanent layoffs that occur in the year during which a firm ceases operating or experiences mass layoffs. This in turn allows us to define worker displacement rigorously. We define displaced workers in two ways. Our first definition identifies displaced workers as those who are permanently laid-off in year t from firms that close during that year. Since this definition identifies displacement through companies' deaths, it does not capture mass layoffs (e.g., those due to plant closures) that occur in multi-establishment companies that do not cease operating. To overcome this limitation, we also use an alternative definition that is broader and includes not only workers who are displaced through firm closures, but also those who lose their job through mass layoffs.

Second, while previous U.S. studies have relied on data sets that are based either on a specific region (e.g., Pennsylvania in Jacobson, Lalonde and Sullivan, 1993) or on relatively small samples drawn from the Panel Study of Income Dynamics (Ruhm, 1991; Stevens, 1997), we rely on a large (10%) data set that is based on a nationally representative sample of Canadian workers. Third, while the aforementioned studies provide evidence that does not go beyond the early 1990s, we provide more recent evidence on the long-term costs of worker displacement since we use data that document post-displacement effects up to 2002.

Fourth, while a recent study (Hijzen, Upward and Wright, 2005) using data from the United Kingdom examines the long-term earnings losses experienced *on average* by workers displaced through firm closures, we extend the analysis of the long-term consequences of displacement due to firm closures by analyzing both the long-term earnings losses experienced *on average* by workers displaced through firm closures and the long-term earnings losses experienced by *high-seniority* workers displaced through firm closures. As our results clearly show, conclusions regarding the *average* long-term earnings losses resulting from firm closures do not generalize to the sub-sample of high-seniority workers displaced through firm closures.

When we pool together workers displaced through firm closures and those displaced through mass layoffs, we find that the long-term earnings losses experienced on average by displaced workers are important. However, those experienced by displaced workers with considerable seniority appear to be even more substantial. Consistent with findings from the United States by Jacobson, Lalonde and Sullivan (1993), high-seniority displaced men experience long-term earnings losses that represent between 18% and 35% of their pre-displacement earnings. For their female counterparts, the corresponding estimates vary between 24% and 35%.

II. Prior research

So far, Canadian research on displacement has focused mainly on the risk of job loss. Picot and Lin (1997) examine the evolution of permanent layoff rates over the 1978 to 1994 period. Looking at years which are comparable in the business cycle, they find no upward trend in permanent layoff rates in the aggregate. However, they observe an increase in the probability of permanent layoffs among older and high-paid workers. Morissette (2004) updates the work of Picot and Lin (1997) and finds little evidence that Canadian workers' chances of being permanently laid-off rose substantially between the late 1980s and the late 1990s. He shows that while the risk of job loss has increased in a non-negligible way in some industries and in large firms of the private sector, men and women of different age groups have generally not

experienced drastic increases in their likelihood of being permanently laid-off. Both studies implicitly include in their measure of job loss: a) layoffs resulting from firm closures, b) mass layoffs not resulting from firm closures (e.g., mass layoff due to downsizing) and, c) layoffs that occur on an individual basis.

To our knowledge, Picot and Wannell (1987) and Crossley et a'. (1994) are the only Canadian studies that analyze workers' earnings losses following displacement. Picot and Wannell (1987) use the 1986 Survey of Displaced Workers and compare weekly earnings in the new job obtained after displacement to weekly earnings in the job held prior to displacement. Crossley et al. (1994) perform a similar exercise using hourly wage data from a survey of 1,736 workers involved in mass layoffs in the early 1980s in 21 establishments in Ontario. Because they simply compute the earnings changes observed between the two types of jobs, neither of these two studies account for the potential earnings growth displaced workers might have enjoyed in the absence of displacement. Furthermore, the numbers presented are short-run estimates and thus, cannot be used to assess the magnitude of the long-term earnings losses experienced by Canadian workers as a result of displacement.

In contrast, numerous U.S. studies have documented the magnitude of the long-term earnings losses due to displacement (see the reviews by Fallick, 1996 and Kletzer, 1998). Using Pennsylvania administrative data, Jacobson, Lalonde and Sullivan (1993) show that the earnings losses of high-tenure prime-age workers persist well beyond a period of unemployment due to mass layoffs. Earnings fall even before the displacement takes place and drop sharply at the time of the displacement. Even five years after the displacement took place, high-seniority displaced workers report quarterly earnings that are about 25% lower than their pre-displacement earnings. Worse still, it seems very likely that the earnings of displaced workers do not return to their expected levels at any time. Ruhm (1991) and Stevens (1997) also analyze the earnings losses of displaced workers, using data from the Panel Study of Income Dynamics. While Ruhm (1991) finds that, four years after displacement, weekly earnings of displaced workers are 10 to 13% lower than those of their non-displaced counterparts, Stevens (1997) shows that the annual earnings of displaced workers remain about 9% below their expected levels six or more years after displacement.[1]

Recently, Hijzen, Upward and Wright (2005) use a 1% sample of employees in the United Kingdom and examine earnings losses resulting from business closures. Contrary to findings from U.S. studies, they find that earnings losses, while initially large, last less than four or five years.

While the aforementioned studies have substantially improved our understanding of the long-term consequences of worker displacement, they are subject to a certain number of limitations.

First, U.S. studies have been unable to exclude from their sample (of displaced workers) individuals who voluntarily quit their job (Jacobson, Lalonde and Sullivan, 1993) and/or those who have been fired due to bad performance (Ruhm, 1991; Stevens, 1997). To overcome this limitation, some have relied on a sample of workers who separated from their employer as a

1. While Jacobson, Lalonde and Sullivan (1993) require displaced workers to have at least six years of tenure with their employer, Ruhm (1991) and Stevens (1997) do not impose this restriction.

result of mass layoffs (Jacobson, Lalonde and Sullivan, 1993). In contrast, the data set we use in this study allows us to separate quits, layoffs and other types of separations and to identify layoffs that occur in the year during which a firm ceases operating or experiences mass layoffs. This in turn allows us to define worker displacement rigorously.

We define displaced workers in two ways. Our first definition identifies displaced workers as those who are permanently laid-off in year t from firms that close during that year. Since this definition identifies displacement through companies' deaths, it does not capture mass layoffs (e.g., those due to plant closures) that occur in multi-establishment companies that do not cease operating. To overcome this limitation, we also use an alternative definition that is broader and includes not only workers who are displaced through firm closures, but also those who lose their job through mass layoffs. Since firm closures and mass layoffs affect most/all workers in a given firm, irrespective of their abilities and/or recent performance on the job, focusing on displacements that occur as a result of firm closures and/or mass layoffs mitigates the sample selection problem associated with the event of job loss. As Gibbons and Katz (1991) have argued, this sample selection problem can be important for workers laid-off on an individual basis.[2]

A second limitation of previous U.S. studies is that they have relied on data sets that are based either on a specific region (e.g., Pennsylvania in Jacobson, Lalonde and Sullivan, 1993) or on relatively small samples drawn from the Panel Study of Income Dynamics (Ruhm, 1991; Stevens, 1997), In contrast, we rely on a large (10%) data set that is based on a nationally representative sample of Canadian workers.

Third, while the aforementioned U.S. studies provide evidence that does not go beyond the early 1990s, we can provide more recent evidence on the long-term costs of worker displacement since we use data on post-displacement effects that go as far as 2002.

Fourth, while Hijzen, Upward and Wright (2005) use a 1% random sample of workers displaced through firm closures, we use a 10% sample of workers displaced through firm closures. This allows us to assess not only the average earnings losses experienced by these displaced workers, but also those experienced by the subset of displaced workers who have substantial seniority with the firm. Like Hijzen, Upward and Wright (2005), we find some evidence that average earnings losses experienced by workers displaced through firm closures disappear fiver years after displacement. However, when we focus our attention on the sub-sample of high-seniority workers displaced though firm closures—an exercise that Hijzen, Upward and Wright (2005) do not perform—we find that these workers experience long-term (i.e., five-year after displacement) earnings losses that represent between 19% and 35% of their pre-displacement earnings. This strongly suggests that Hijzen, Upward and Wright's finding does not generalize to all workers displaced through firm closures.

Finally, since the studies above rely on data from the Unites States or the United Kingdom, the degree to which their results apply to the Canadian economy remains unclear.

2. See also Doiron (1995) for a Canadian test of this hypothesis.

III. Data

The data set we use to measure the earnings losses of displaced workers is the Longitudinal Worker File (LWF).[3] The LWF is created by the Business and Labour Market Analysis (BLMA) Division of Statistics Canada. It is a 10 % random sample of all Canadian workers, constructed by integrating data from four sources: the Record of Employment (ROE) files of Human Resources and Social Development Canada (on worker separations), the T1 and T4 files of Canada Customs and Revenue Agency, and the Longitudinal Employment Analysis Program (LEAP) of BLMA, Statistics Canada. In its current version, the LWF has a 20-year longitudinal window since it follows individuals over the 1983 to 2002 period.

The *Employment Insurance Act* and its Regulations require every employer to issue a ROE when an employee working in insurable employment has an interruption in earnings. The information contained on the ROE is used to determine if a person qualifies for Employment Insurance (EI) benefits, the benefit rate and the duration of his/her claim. The ROE must be issued even if the employee does not intend to file a claim for EI benefits. More importantly, the ROE indicates the reason for the work interruption or separation.[4] The ROE can thus be used to identify workers who are laid-off, who quit or who separate from their employer for other reasons.

One key feature of the LWF is the fact that it is linked to LEAP, a longitudinal file that tracks all Canadian companies. Since LEAP identifies firms' births and deaths, the linkage between LEAP and LWF allows us to identify layoffs that occur as a result of firm closures.[5] This in turn allows us to construct a rigorous indicator of worker displacement: a displacement is defined as taking place when a worker is permanently laid-off in year t from a firm that ceased operating during that year.[6] Since firm closures affect all workers in a given firm, irrespective of their abilities and/or recent performance on the job, focusing on displacements that occur as a result of firm closures mitigates the sample selection problem associated with the event of job loss. As Gibbons and Katz (1991) have argued, this sample selection problem can be important for workers laid-off on an individual basis.

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3. In principle, the Survey of Labour and Income Dynamics could be used to examine the earnings trajectories of displaced workers. However, this survey follows individuals only over six years, thereby preventing a thorough analysis of workers' earnings several years prior to and after displacement.

4. A penalty under the *Employment Insurance Act* for non-compliance may apply to employers who fail to issue a ROE. Moreover, employers who enter a false or misleading reason for a separation may be subject to penalty or prosecution.

5. The universe of LEAP includes businesses, incorporated or not, that issue a record of employment earnings to each of its employees for tax purposes (a T4 remittance slip). Businesses comprised solely of individuals or partnerships that do not draw a salary are excluded from LEAP. Considerable methodological verification takes place to ensure that the longitudinal linkage of companies is reliable. In particular, "false" deaths are identified by using a "labour tracking" methodology aimed at distinguishing merger/acquisitions from real firm closures. See Baldwin, Dupuy and Penner (1993) for more details.

6. In contrast, Jacobson, Lalonde and Sullivan (1993) cannot precisely identify the type of separation (e.g., quits, layoffs) experienced by their sample of workers. For that reason, they focus their analysis on workers who separate from firms experiencing severe employment reductions. Likewise, Stevens (1997) defines displacement as leaving due to a plant or business closing or due to being laid-off or fired. Thus, she cannot eliminate from her sample of displaced workers individuals who were fired for cause. Because we can identify precisely the type of separation and focus on layoffs due to firm closures, we can avoid both of these problems.

In addition, all employers must register with Canadian Customs and Revenue Agency and issue to each employee a T4 slip that summarizes earnings received in the year. The T4 files provide information on virtually all Canadian workers. Thus, the number of workers who are at risk of being displaced are known from the T4 files while the number of workers who are actually displaced are known by combining the ROE files and LEAP. Furthermore, combining the T4 files, the ROE files and LEAP allows us to construct a comparison group of workers who never experienced displacement during the observation period.

Another advantage of the LWF is its very large sample size, which allows detailed analyses of the earnings losses of various groups of displaced workers. Below, we take advantage of this large sample size by conducting separate analyses for various age-gender groups, industries and firm size classes.

While the LWF allows us to identify firm closures, it contains no information on establishment closures. Because many large firms consist of multiple establishments, plant closures may occur and cause mass layoffs without inducing firm closures. Since our first definition of displacement is based on firm closures, it will not capture these job losses. To take these into account, we use a broader definition of displacement that includes not only workers who lose their job through firm closures, but also those who lose their job through mass layoffs.

We define mass layoffs as permanent layoffs that occur in year t in firms that had at least 50 employees in year t-4 and experienced a drop in employment of 30% or more between year t-4 and year t+1, the year following layoffs.

Like most administrative data sets, the LWF contains no information on workers' labour force status, education, occupation, visible minority status and immigration status. Hence, it does not allow separate analyses for, say, workers with different education levels. While these limitations should be kept in mind, the fact that the LWF follows a large and nationally representative sample of workers over a substantial period makes it a unique data set to assess the magnitude of the earnings losses experienced by displaced workers both in the short run and the long run. Furthermore, the econometric models we use allow considerable flexibility in specifying workers' age-earnings profiles. As will be shown below, workers' age-earnings profiles will be allowed to differ both in terms of their intercepts and their slope, thereby accounting for the possibility that some workers (e.g., university graduates) may start their career with lower earnings (i.e., a small intercept) than other workers (e.g., high school graduates) but may experience relatively faster earnings growth (i.e., have a steeper slope) subsequently.

IV. Methodology and sample selection

To measure the long-term costs of worker displacement, we proceed in two steps. We start by regressing workers' annual earnings on a full set of province by year dummy variables. The residuals y_{it} resulting from this first-stage regression provide measures of workers' earnings that are purged of province-specific business cycle effects and province-specific trends in earnings. We then regress these residuals y_{it} using the following econometric specification, employed by Jacobson, Lalonde and Sullivan (1993) and Stevens (1997):

$$(1)\ y_{it} = \alpha_i + X_{it}B + \sum_{k=a}^{b} D_{it}^{\,k}\delta_k + \omega_i t + \varepsilon_{it}$$

where y_{it} denotes the (first-stage regression) adjusted annual earnings of worker i in year t, X_{it} is a vector of observable worker characteristics, D_{it}^{k} is a vector of dummy variables that equal 1 if worker i is displaced k years prior to year t (and $D_{it}^{k}=0$ otherwise), α_i is a vector of person-specific fixed effects, $\omega_i t$ are worker-specific time-trends and ε_{it} is an error term. Since displaced workers might be less skilled than other workers, they might have had, in the absence of displacement, lower earnings and slower earnings growth than non-displaced workers. Therefore, it is crucial to allow both the intercept and the slope of the age-earnings profiles of displaced workers to differ from those of other workers. Because it includes both person-specific fixed effects (α_i) and person-specific time trends ($\omega_i t$), equation (1) allows such flexibility.[7]

It must be emphasized that when we estimate fixed-effects models ($\alpha_i \neq 0$; $\omega_i=0$) or models with person-specific time trends ($\alpha_i \neq 0$; $\omega_i \neq 0$), many worker characteristics, such as education, visible minority status, immigration status, immigrants' country of origin are eliminated from equation (1) since they do not vary over time. Hence, while the absence of the aforementioned variables in our data set precludes separate analyses by, say, workers' education level or visible minority status, it does not prevent us from estimating flexible econometric models that allow workers' heterogeneity to influence both intercepts and earnings growth rates, a pattern documented by Baker (1997).

Since there is evidence that the earnings of displaced workers start to fall substantially at least three years before displacement (Jacobson, Lalonde and Sullivan, 1993: 687), we specify a= -3. In order to allow displacement to affect earnings over several years, we specify b = 5. Thus, we allow displacement to affect workers' earnings up to three years before and up to five years after it occurred.

IV.1 Displacements experienced by high-seniority workers

We start our analyses by focusing on displacements experienced by high-seniority workers, which we define as those who have been in the same firm for five years or more. The rationale for focusing on these workers is that concerns regarding job losses often concentrate on workers with substantial seniority, for whom layoffs through firm closures may imply the loss of firm-specific skills and for whom re-employment and training may prove difficult (Kletzer, 1998). As mentioned above, Jacobson, Lalonde and Sullivan (1993) suggest that long-term earnings losses for this group of displaced workers are substantial.

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7. Fixed effects models ($\alpha_i \neq 0$; $\omega_i=0$) are estimated by regressing deviations from person-specific means in our residuals (y_{it}) on deviations from person-specific means in our explanatory variables. Models with person-specific time trends ($\alpha_i \neq 0$; $\omega_i \neq 0$) are estimated in two steps. First, we take first-differences in our residuals y_{it} and in our explanatory variables. Second, we express these first-differences in terms of deviations from person-specific means and regress the resulting transformed dependent variables on the resulting transformed regressors.

When analyzing displacement for high-seniority employees, we select a sample of displaced workers that consists of 10 cohorts of individuals who: a) were displaced through firm closures (or through firm closures *and* mass layoffs) that took place in the commercial sector between 1988 and 1997, b) were aged 25 to 49 at the time of displacement, and c) had 5 years of seniority or more at the time of displacement.[8] We follow each of these 10 cohorts for a period of time that starts in 1988 and ends 5 years after displacement, at which point they will be aged at most 54.[9] We impose the aforementioned age restrictions in order to ensure that workers' earnings trajectories after displacement are not contaminated by early retirement patterns.[10]

For both definitions of displacement, we consider two sub-samples of displaced workers. The first consists of individuals who have positive earnings in all five years following displacement. Because it excludes displaced workers who had no earnings at some point after displacement as a result of long-term unemployment, this narrow sub-sample focuses on the experiences of the most successful displaced individuals.

Our second sub-sample of displaced workers is broader, since it allows displaced workers to have no earnings at some point after displacement, while requiring them to have positive earnings in the fifth year following displacement. By allowing displaced workers to have no earnings in some of the years following displacement, we take into account the possibility that displacement may lead to long-term unemployment and/or temporary withdrawals from the labour force. As long as temporary withdrawals from the labour force are induced by a discouraged worker effect (rather than an exogenous increase in individuals' preferences for leisure), they will reflect workers' difficulty of adjusting to job loss and thus, should be considered when quantifying the magnitude of the earnings losses. Since displaced workers who never have positive earnings after displacement may have moved into self-employment permanently, left the country or died, and since our data set contains no information that allows us to distinguish these three scenarios, we restrict earnings in year t+5 to be positive in order to exclude these displaced workers from our analyses.[11]

Our comparison group consists of workers who: a) were aged 25 to 40 in 1988, b) had positive earnings throughout the 1983 to 2002 period, and c) never experienced a permanent layoff during

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8. Displaced workers are allowed to move from the commercial sector to the public sector in the years following displacement.

9. For instance, our regressions will use data covering the 1988 to 1993 period for the 1988 cohort and data covering the 1988 to 2002 period for the 1997 cohort. Because we allow displacement to affect earnings up to five years after its occurrence, we need five years of data prior to 1988 to construct our indicators of post-displacement. Since the Longitudinal Worker File (LWF) starts in 1983, this implies that data covering the 1983 to 1987 period cannot be used in our regression analyses.

10. For the same reason, earnings data observed six years or more after displacement are not used in the regression analysis.

11. Note that by doing so, we also exclude displaced workers who withdraw permanently from the labour force and those who remain unemployed permanently after displacement. Our inability to distinguish long-term unemployment spells from withdrawals from the labour market is due to the fact that the LWF—like many administrative data sets—contains no information on workers' labour force status.

the 1983 to 2002 period.[12] The earnings trajectories observed for these workers during the 1988 to 2002 period are used in our regression analyses.[13]

For our comparison group and the two sub-samples of high-seniority displaced workers, we further restrict our attention to individuals who: a) never lived outside the 10 provinces during the observation period, and b) never earned more than $200,000 per year (in 2000$) during the observation period.[14] All analyses are conducted for men and women separately.

Our main interest in this paper is to quantify the magnitude of the earnings losses that Canadian workers incur as a result of firm closures or mass layoffs, *whether or not these earnings losses result from multiple job losses.* For this reason, we choose *not* to control for the subsequent displacements that workers may incur while they adjust to the first displacement they experienced between 1988 and 1997. As Stevens (1997) shows, multiple job losses are one reason why displaced workers suffer substantial earnings losses in the long run.

IV.2 Displacements experienced by all workers

Subsequently, we analyze the consequences of displacements for all displaced workers, whatever their level of seniority is. When doing so, our sample of displaced workers and our comparison group are the same as those defined in Section IV.1, with the exception that displaced workers are no longer required to have five years of seniority or more with their employer.

V. Descriptive evidence

In Table 1, we show what percentage of workers aged 25 to 49 have been displaced or permanently laid-off between 1988 and 2002.[15] During that period, permanent layoff rates varied between 6.6% and 9.1% for men and between 3.4% and 5.3% for women. Displacement rates due to firm closures were lower and suggest that roughly one permanently laid-off worker out of 10 lost his job through firm closures over the last two decades.[16] The implication is that displaced workers, defined narrowly as employees who are permanently laid-off through firm closures, represent a relatively small group of individuals. Over the 1988 to 2002 period, between 23,000 and 44,000 males aged 25 to 49 were displaced in a given year. For women in the same age group, the corresponding numbers are 11,000 and 18,000. Including workers aged 50 to 64

12. Note that we select for our comparison group an age interval, as defined in 1988 (25 to 40), that is narrower than that used for our sample of displaced workers at the time of displacement (25 to 49). We do so in order to ensure that the two groups have similar age distributions, as will be shown below.

13. We require workers in the comparison group to have experienced no layoffs between 1983 and 1987 (as well as between 1988 and 2002) because we do not want their earnings in 1988 to be affected by previous layoffs.

14. However, we allow individuals to move between provinces over time. We also require displaced workers to be employed in firms with at least two employees, in order to exclude incorporated self-employed individuals with no paid help, who would issue a T4 slip for themselves.

15. Workers are defined as permanently laid-off when they do not return to their former employer in the same year or in the year following the layoff.

16. This conclusion also holds for workers aged 50 to 64. See Appendix Table 1.

(Appendix 1) and pooling both sexes, the Longitudinal Worker File estimates that, among employees aged 25 to 64, an average of 55,000 workers were displaced per year through firm closures between 1988 and 2002.

Since workers may be displaced not only through firm closures, but also through mass layoffs that do not lead to firm closures, we also present displacement rates using a broader definition of displacement that captures both sets of events. When we move from a definition of displacement that includes only job losses due to firm closures to a broader definition that adds mass layoffs to firm closures, estimates of the number of displaced workers double. Of all employees aged 25 to 64, an average of roughly 110,000 were displaced through firm closures or mass layoffs during the 1988 to 2002 period.

Table 2 shows how displacement rates varied across a certain number of dimensions in 2002. Important differences are observed across firm sizes. Men and women employed in small firms (those employing between 2 and 19 workers) are much more likely to lose their job through firm closures than their counterparts employed in large firms (those with 500 or more employees). Since many large firms consist of multiple establishments and since the LWF cannot identify establishment deaths, differences in displacement rates, measured across firm sizes, might exceed differences in displacement rates measured across establishment sizes.[17] If so, using a definition of displacement that includes mass layoffs would tend to reduce differences across firm sizes. This is indeed what happens when we consider our broader definition of displacement.

Displacement rates also differ by industry. Construction workers and those employed in agriculture, forestry, mining, oil and gas extraction industries have greater chances of being displaced than other workers.

In Table 3, we examine how many displaced workers have 5 years of seniority or more. The data suggest that every year, between 2,300 and 3,400 high-seniority males between the ages of 25 and 49 lost their job through firm closures during the 1990s. For women, the corresponding numbers vary between 1,200 and 1,900. Using a broader definition of displacement indicates that between 5,500 and 13,000 high-seniority men aged 25 to 49 lost their job through firm closures or mass layoffs during the 1990s. The corresponding numbers for their female counterparts vary between 3,200 and 4,900.

Selected characteristics of high-seniority displaced workers and of the comparison group, as measured in 1987, are presented in Table 4. Men and women in our samples of displaced workers have very similar mean and median ages, as compared to their counterparts in the comparison group. However, the annual earnings of displaced individuals are markedly lower than those of individuals in the comparison group. This simple fact highlights the need to control for heterogeneity in worker's age-earnings profiles, either through fixed-effects models or through models with worker-specific trends, both of which are incorporated in equation (1).

17. For instance, if a manufacturing firm that consists of two establishments employing each 100 workers sees one of its plants close, displacement rates defined at the establishment level will be positive among establishments with 100 to 499 employees but will amount to zero, when defined at the firm level, among firms with 100 to 499 employees.

In Figures 1 and 2, we show the earnings trajectories of two cohorts of high-seniority males: a) those who were displaced through firm closures in 1989 and, b) those who were displaced through firm closures in 1997. The earnings trajectories are shown using either a narrow sub-sample of displaced workers who have positive earnings in all five years following displacement (Figure 1) or the broader sub-sample of displaced workers defined in the previous section (Figure 2).

A comparison of the earnings paths of the two cohorts clearly indicates that the degree to which earnings recover after displacement depends on labour market conditions. Specifically, earnings recovery is much slower for males who were displaced right before the 1990 to 1992 recession (the 1989 cohort) than for their counterparts who were displaced during an expansionary period (the 1997 cohort). This is true for both sub-samples. More important, five years after displacement, earnings of workers displaced in 1989 are no higher than they were in 1988. Combined with the fact that earnings of this cohort were trending upwards prior to displacement, this suggests that, in the absence of displacement, the annual earnings of the 1989 cohort would have been substantially higher in 1994 than they actually were. If so, earnings losses for the 1989 cohort should be substantial, even five years after displacement. A visual inspection of Figures 1 and 2 suggests that the extent to which such a conclusion can be made for the 1997 cohort is unclear and depends on the magnitude of the earnings growth assumed in the absence of displacement. Clearly, both Figures 1 and 2 highlight the need to take account of the labour market conditions that prevail after displacement. We do so in our first-stage estimation procedure by inserting a full set of province-year interactions.

VI. Regression results – Displacements due to firm closures

In this section, we use the econometric approach outlined in Section III to quantify the magnitude of the average earnings losses experienced in the short run and in the longer run by male and female employees who lost their job during the late 1980s and the 1990s as a result of firm closures. We first document the earnings losses of high-seniority displaced workers and then consider all workers displaced through firm closures. In all our regressions, the vector X_{it} used in equation (1) simply consists of a quadratic term in age.

VI.1 High-seniority displaced workers

Table 5 shows the regression results for high-seniority workers who lost their job through firm closures between 1988 and 1997. Results are presented using fixed-effects models, models with worker-specific trends, and models estimated using a narrow sub-sample of displaced workers as well as a broader sub-sample. This leads to four combinations of model specification and sample selections.

Consistent with Jacobson, Lalonde and Sullivan (1993), our multivariate analyses suggest that earnings start to fall before displacement occurs. The timing and the magnitude of the earnings decline prior to displacement varies between fixed-effects models and models with worker-specific trends: the latter set of models generally indicates greater losses prior to displacement. Depending on the choice of the econometric models and the sub-sample used, the earnings losses of displaced males in the year of displacement vary between $9,000 and $12,600 (in 2000$). For

women, the corresponding numbers are $7,100 and $7,900. For both sexes, earnings losses in the year following displacement are even greater.

In virtually all cases, earnings recovery after displacement is very modest. Five years after displacement, the earnings losses for our narrow sub-sample of displaced men amount to roughly $6,600 with the fixed-effects models and to about $9,600 with models that allow person-specific trends in workers' age-earnings profiles. Using our broader sub-sample of displaced men yields estimates of 5-year earnings losses that vary between $8,500 (in fixed-effects models) and $11,600 (in models with worker-specific trends). Since pre-displacement earnings—defined as annual earnings received in year t-4—of high-seniority males in our narrow and broader sub-samples averaged $34,487 and $34,715, respectively, these numbers suggest that the long-term (i.e., 5-year) earnings losses of high-tenure displaced men represent: a) between 19% and 28% of pre-displacement earnings in our narrow sub-sample, and b) between 25% and 34% of pre-displacement earnings in our broader sub-sample. Thus, earnings losses of high-seniority displaced men are substantial and persistent.

The same qualitative conclusions hold for women. Five years after displacement, earnings losses of high-seniority female employees represent: a) between 23% and 29% of pre-displacement earnings in our narrow sub-sample, and b) between 35% and 37% of pre-displacement earnings in our broader sub-sample.[18]

These numbers are of the same order of magnitude as those reported by Jacobson, Lalonde and Sullivan (1993) for a sample of Pennsylvania workers displaced during the 1980s. Five years after separating from their former employer, workers in that U.S. region who were displaced through mass layoffs experienced earnings losses that amounted to roughly 25% of their pre-displacement earnings.

In Table 6, we investigate how long-term earnings losses—losses experienced five years after displacement—vary across population subgroups. For both men and women, we estimate separate models for workers who, at the time of displacement, were: a) aged 25 to 34, b) aged 35 to 49, c) employed in manufacturing, d) employed outside manufacturing, e) employed in firms with 100 employees or less, and f) employed in firms with more than 100 employees.[19]

For women aged 25 to 34, workers aged 35 to 49, women employed outside manufacturing or those employed in firms with 100 employees or less, fixed effects models and models with worker-specific trends yield fairly similar estimates of long-term earnings losses. For instance, they suggest that displaced men aged 35 to 49 experience, in our broad sample, long-term

18. Pre-displacement earnings of high-seniority women in the narrow and broad sub-samples averaged $20,211 and $20,383, respectively.

19. For these population subgroups, the comparison groups selected differ from those used in Section IV.1. For displaced workers aged 25 to 34 (35 to 49), the comparison group is aged 25 to 30 (35 to 40) in 1988. For displaced workers employed in manufacturing (outside manufacturing), the comparison group consists of workers aged 25 to 40 in 1988 and who were employed in manufacturing (outside manufacturing) in 1988. For displaced workers employed in firms with at most 100 employees (more than 100 employees), the comparison group consists of workers aged 25 to 40 in 1988 and who were employed in firms with at most 100 employees (more than 100 employees) in 1988. For displaced workers aged 25 to 34 (35 to 49), very similar results were obtained when using workers aged 25 to 32 (33 to 40) in 1988 as a comparison group.

earnings losses that represent between 22% and 26% of pre-displacement earnings. For their female counterparts, the corresponding estimates vary between 32% and 35%.

In contrast, estimates of long-term earnings losses differ by 10 percentage points or more, depending on the econometric models used, among men aged 25 to 34, manufacturing workers, men employed outside manufacturing and men employed in firms with more than 100 employees. For all these subgroups, models with person-specific trends yield larger estimates of long-term losses than fixed effects, thereby suggesting that the assumption (underlying fixed-effects models) that age-earnings profiles of displaced workers have the same slope as those of workers in the comparison group is, for these subgroups, invalid.

More important, in most subgroups and econometric models considered, the results of Table 6 indicate that long-term earnings losses of displaced workers amount to at least 20% of pre-displacement earnings. Thus, the large long-term earnings losses that high-seniority displaced workers suffer as a result of firm closures appear to be pervasive.

VI.2 All displaced workers

While they are of high interest for reasons outlined above, high-seniority displaced workers represent a fairly small fraction of all workers displaced through firm closures (Table 3). In this context, it is worth broadening our perspective on the consequences of displacement and ask the following question: on average, what is the magnitude of the earnings losses experienced by workers who lose their job through firm closures?

We answer this question in Table 7. Like for high-seniority workers, there is evidence that earnings start to fall prior to displacement. Moreover, earnings losses reach their maximum in the year following firm closures. However, a comparison of Tables 5 and 7 reveals that average earnings losses experienced by displaced workers in the year following displacement are smaller than they are for the subset of high-seniority displaced workers: earnings losses experienced by the former group represent between 33% and 81% of those experienced by the latter.

While both fixed-effects models and models with worker-specific trends indicate that long-term earnings losses of high-seniority workers are substantial, this conclusion no longer holds when we consider all workers displaced through firm closures. Fixed-effects models suggest large earnings losses five years after displacement. They indicate that these losses represent between 16% and 22% of pre-displacement earnings for men and between 25% and 34% of pre-displacement earnings for women.[20] In contrast, models with worker-specific trends indicate that earnings losses, whenever they happen, are no longer statistically significant at conventional levels more than three years after displacement.

In sum, workers who lose their job through firm closures clearly experience short-term earnings losses. Whether they also suffer earnings losses in the long run depends critically on the econometric specification chosen.

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20. Annual earnings of displaced males in year t-4 average $28,212 and $27,858 in the narrow sub-samples and the broad sub-samples, respectively. For women, the corresponding numbers are $16,928 and $16,700.

VII. Regression results – Displacements due to firm closures or mass layoffs

Admittedly, worker displacement can occur not only through firm closures, but also through mass layoffs that do not lead to firm closures. In single-establishment companies, mass layoffs sometimes lead to big employment losses without necessarily leading to the death of these companies. In multi-establishment companies, mass layoffs may lead to the closure of one of the establishments formerly in operation. Since mass layoffs that do not cause firm closures are not captured in our initial definition of displacement, we now broaden our definition of displacement and consider both workers who are displaced through firm closures and those who are displaced through mass layoffs that do not lead to firm closures.

VII.1 High-seniority displaced workers

When adding mass layoffs to the definition of displacement we use for high-seniority workers, we add high-tenure employees who were permanently laid-off in year t from firms that: a) had 50 or more employees in year t-4 and, b) experienced a drop in employment of 30% or more between t-4 and t+1.[21] Our comparison group is the same as that defined in Section IV.1.

The results are presented in Table 8. They confirm those of Table 5, i.e., long-term earnings losses of high-seniority displaced workers are substantial. For displaced men in the narrow sub-sample, long-term earnings losses vary between $7,100 and $10,900, thereby representing between 18% and 28% of pre-displacement earnings. For those in the broad sub-sample, the corresponding numbers vary between $9,700 and $13,700 (i.e., between 25% and 35% of pre-displacement earnings).

For women in the narrow sub-sample, long-term earnings losses represent between 24% and 26% of pre-displacement earnings. For those in the broad sub-sample, they represent about 35% of pre-displacement earnings.

In Table 9, we replicate Table 6. All of the estimates of long-term earnings losses shown in Table 9 are statistically significant at the 5% level. Once again, our conclusion that earnings losses of high-seniority workers are substantial and persistent holds for most population subgroups considered. One difference worth noting is that estimates of long-term earnings losses for workers employed in firms with more than 100 employees have a much smaller dispersion when we consider our broader definition of displacement than we use our initial definition. For example, when we consider displaced males in the narrow sub-sample, these estimates vary between 13% and 38% in Table 6 (using our initial definition of displacement) and between 15% and 22% in Table 9 (using our broader definition of displacement). One possible explanation for this difference is that including mass layoffs will likely increase markedly the number of displaced workers in that sample, thereby providing us with potentially more accurate estimates.

21. We also require the firm to be the main employer of the worker in year t-4 (i.e., to provide the greatest annual earnings during that year).

VII.2 All displaced workers

When adding mass layoffs to the definition of displacement we use for all displaced workers, we add employees who worked for a given firm in both year t-1 and year t and were permanently laid-off in year t from this firm. We require these firms to have: a) had 50 or more employees in year t-4, and b) experienced a drop in employment of 30% or more between t-4 and t+1.[22] Our comparison group is the same as that defined in Section IV.1.

Table 10 replicates Table 7. As was the case with our initial definition of displacement (i.e., displacement due to firm closures), fixed effects models indicate that workers displaced through firm closures or mass layoffs experience substantial earnings losses five years after displacement.

However, contrary to the results obtained with our initial definition of displacement, models with worker-specific trends also suggest the presence of non-negligible long-term earnings losses. Although these are more moderate than those obtained with fixed-effects models, they represent between 9% and 16% of pre-displacement earnings for men and between 12% and 22% of pre-displacement earnings for women, depending on the sub-sample considered.

Taken together, both models suggest that long-term earnings losses of displaced males represent between 9% and 15% of pre-displacement earnings in the narrow sub-sample, and between 16% and 22% of pre-displacement earnings in the broad sub-sample. For women, the corresponding ranges of estimates are 12% to 21% and 22% to 31%, respectively.

Thus, defining displaced workers as individuals who lose their job through firm closures or mass layoffs yields an unambiguous conclusion regarding the long-term earnings losses experienced on average by these workers: whatever models and sub-samples are considered, these losses are non-negligible but are more moderate than those experienced by high-seniority workers.

VIII. Summary

Table 11 summarizes our findings regarding the magnitude of the earnings losses experienced five years after displacement. Four points are worth noting. First, for a given definition of displacement and a given sub-sample (narrow versus broad), fixed effects models produce very similar estimates of long-term earnings losses across categories of displaced workers (high-seniority displaced workers versus all displaced workers).

Second, for a given sub-sample and a given category of displaced workers, changing the definition of displacement does not alter much the estimates of long-term earnings losses obtained from fixed-effects models. The same conclusion does not hold for models with worker-specific trends when all displaced workers are considered. However, when the focus is on high-seniority workers, changing the definition of displacement does not much alter the estimates of long-term earnings losses obtained from models with worker-specific trends. Hence, conditional on model specification, results regarding high-seniority workers are extremely robust to definitional choice.

22. We also require the firm to be the main employer of the worker in year t-1.

Third, for high-seniority workers, moving from fixed-effects models to models with worker-specific trends increases long-term earnings losses for men but decreases them slightly or leaves them unchanged for women. In contrast, moving from fixed-effects models to models with worker-specific trends decreases the magnitude of the long-term earnings losses when the focus is on all displaced workers. This is especially true when the first definition of displacement is considered.

Fourth, inspection of the results reveals that when we consider all displaced workers, estimates derived from our broader definition of displacement are much more robust to model specification than those derived from our first and, admittedly narrower, definition of displacement. For instance, estimates of long-term earnings losses, as a percentage of pre-displacement earnings, differ by only 6 percentage points for displaced males in the narrow sub-sample when using the broader definition. This is much less than the 20 percentage-point difference observed for this group when using the first definition. When we consider high-seniority workers, the broader definition is as robust to model specification as the first one. Since the broader definition is, on conceptual grounds, superior to the first one—displacement may result not only from firm closures but also from mass layoffs that do not lead to firm closures—it is reassuring to note that our estimates of long-term earnings losses are generally more robust when using this definition than the first one.

Using this broader definition, long-term earnings losses of high-seniority displaced males represent between 18% and 35% of pre-displacement earnings. For their female counterparts, the corresponding numbers vary between 24% and 35%. When considering all displaced men, the interval of losses is 9% to 22%, as compared to 12% to 31% for all displaced women.

It should be emphasized that these numbers represent average losses for workers who have been displaced between 1987 and 1997. As was shown in Figures 1 and 2, it is conceivable that the earnings losses of displaced workers vary depending on labour market conditions. To investigate this issue, we re-estimated the fixed effects models of Table 8 and allowed the displacement dummies to be interacted with a binary indicator that was equal to 1 if a worker was displaced between 1993 and 1997, 0 otherwise.

The results clearly confirmed that workers displaced during the 1987 to 1992 period suffered much larger earnings losses than their counterparts who lost their job during the 1993 to 1997 period. Whatever samples were considered, high-seniority male and female workers who were displaced during the first period experienced, five years after displacement, earnings losses that were between $5,300 and $5,800 higher than those experienced by their counterparts who were displaced during the second period. For example, in our narrow (broad) sample, long-term earnings losses of high-seniority males who were displaced between 1987 and 1992 averaged roughly $11,300 ($14,300), much more than the losses of about $6,100 ($8,700) suffered by those who were displaced between 1993 and 1997. Similarly, long-term earnings losses of high-seniority females who were displaced between 1987 and 1992 averaged roughly $11,000 ($12,600), much more than the losses of about $5,100 ($7,000) suffered by their counterparts who were displaced between 1993 and 1997.

Similar qualitative conclusions were obtained when re-estimating the fixed effects models of Table 10. Whatever samples were considered, male (female) workers displaced between 1987

and 1992 suffered long-term earnings losses that were between $2,600 and $3,000 (between $1,500 and $1,700) higher than those experienced by their counterparts who were displaced between 1993 and 1997.

IX. Conclusion

Over the 1988 to 2002 period, an average of 110,000 Canadian workers aged 25 to 64 lost their job through firm closures or mass layoffs. What happened to these workers' earnings after displacement is an important question that has received relatively little attention in Canada so far. The contribution of this paper is to fill this gap, using a unique longitudinal data set that allows us to select workers who were permanently laid-off in the year their company shut down or suffered severe employment reductions.

Our main finding is that while the long-term earnings losses experienced on average by workers who are displaced through firm closures or mass layoffs are important, those experienced by displaced workers with considerable seniority appear to be even more substantial. Consistent with findings from the United States by Jacobson, Lalonde and Sullivan (1993), high-seniority displaced men experience long-term earnings losses that represent between 18% and 35% of their pre-displacement earnings. For their female counterparts, the corresponding estimates vary between 24% and 35%.

Several limitations should be noted. We did not take into account the possibility that displaced workers may use self-employment as a mechanism to mitigate the income losses they incur as a result of displacement. Our inability to do so results from the fact that the Longitudinal Worker File contains no information on self-employment income. Nevertheless, our results shed light on an important issue: the extent to which income from paid employment recovers after displacement. Assessing whether employees receive lower wages and salaries after displacement is a question of interest to policymakers, *whether or not displaced workers offset the drop in their income from paid employment through self-employment income.*

While we have shown that high-seniority displaced workers suffer substantial earnings losses even five years after displacement, we did not investigate the mechanisms that explain their slow earnings recovery. While empirical work by Stevens (1997) suggest that multiple job losses following displacement might be an important contributing factor, the degree to which mobility patterns across industries and firm sizes improves workers' chances of enjoying strong earnings recovery remains unknown. Likewise, the extent to which various search methods are effective in fostering strong earnings recovery has not been assessed.

Despite these limitations, our results confirm an important finding of previous U.S. studies: high-seniority workers who are displaced either through mass layoffs or firm closures suffer earnings losses that are substantial and persistent and thus, likely experience a permanent drop in income.

Table 1a Displacement rates and permanent layoff rates of aged 25 to 49,[1] 1988 to 2002

	Men			Women		
	Permanent layoff rates	Displacement rates due to:		Permanent layoff rates	Displacement rates due to:	
		Firm closures	Firm closures + mass layoffs		Firm closures	Firm closures + mass layoffs
	percentage					
1988	8.2	0.8	1.6	4.5	0.5	0.7
1989	7.6	0.8	1.5	4.0	0.5	0.7
1990	9.0	1.1	2.2	4.8	0.6	1.0
1991	9.1	0.8	2.3	4.9	0.5	1.0
1992	8.9	0.9	2.4	4.7	0.5	1.0
1993	8.2	0.7	1.7	4.4	0.4	0.8
1994	7.8	0.7	1.6	4.1	0.4	0.9
1995	7.7	0.7	1.4	4.0	0.4	0.8
1996	7.5	0.7	1.3	4.0	0.4	0.8
1997	7.4	0.7	1.1	4.1	0.4	0.7
1998	7.4	0.7	1.3	4.0	0.4	0.7
1999	7.0	0.6	1.1	3.8	0.4	0.7
2000	6.6	0.6	1.1	3.4	0.4	0.6
2001	8.3	0.7	1.8	5.3	0.5	1.1
2002	7.8	0.6	1.3	4.8	0.4	0.8

Table 1b Estimated number of workers displaced or permanently laid-off workers aged 25 to 49,[1] 1988 to 2002

	Men			Women		
	Permanently laid-off	Displaced due to:		Permanently laid-off	Displaced due to:	
		Firm closures	Firm closures + mass layoffs		Firm closures	Firm closures + mass layoffs
1988	309,760	30,220	60,441	125,000	13,890	19,446
1989	296,700	31,230	58,560	117,410	14,680	20,548
1990	357,220	43,660	87,320	146,510	18,310	30,523
1991	358,840	31,550	90,697	150,890	15,400	30,794
1992	346,740	35,060	93,503	144,600	15,380	30,767
1993	319,250	27,250	66,187	135,930	12,360	24,714
1994	308,020	27,640	63,184	129,050	12,590	28,328
1995	308,340	28,030	56,061	129,100	12,910	25,821
1996	303,930	28,370	52,682	131,860	13,190	26,372
1997	308,660	29,200	45,883	142,940	13,950	24,405
1998	314,140	29,720	55,186	146,340	14,630	25,610
1999	301,500	25,840	47,379	144,530	15,210	26,625
2000	290,540	26,410	48,482	134,540	15,830	23,783
2001	319,410	26,940	69,273	150,080	14,160	31,149
2002	300,150	23,090	50,025	136,610	11,380	22,769

1. Employed outside public services in firms with at least two employees.

Source: Statistics Canada, Business and Labour Market Analysis Division, the Longitudinal Worker File.

Table 2 Displacement rates of workers aged 25 to 49, by selected characteristics, 2002[1]

	Displacement due to			
	Firm closures		Firm closures + mass layoffs	
	Men	Women	Men	Women
	percentage			
Overall	0.6	0.4	1.3	0.8
Age				
25 to 29 years	0.7	0.4	1.4	0.7
30 to 34 years	0.6	0.4	1.3	0.8
35 to 39 years	0.6	0.4	1.2	0.8
40 to 44 years	0.6	0.4	1.2	0.8
45 to 49 years	0.5	0.5	1.1	0.8
Firm size				
2 to 19 employees	1.5	1.0	1.8	1.1
20 to 99 employees	0.7	0.6	1.6	1.1
100 to 499 employees	0.4	0.3	1.5	0.9
500 or more employees	0.1	0.1	0.7	0.4
Region				
Atlantic Provinces	1.1	0.7	1.9	1.4
Quebec	0.6	0.5	1.2	0.8
Ontario	0.5	0.3	1.0	0.6
Manitoba	0.3	0.4	0.9	0.7
Saskchewan	0.6	0.4	1.3	0.7
Alberta	0.6	0.3	1.1	0.7
British Columbia	0.8	0.6	1.8	1.0
Industry				
Agriculture, forestry, mining, oil and gas extraction	1.1	0.9	2.7	2.0
Utilities	0.1	0.1	0.5	0.5
Construction	1.4	0.8	3.1	1.5
Manufacturing	0.4	0.5	1.1	1.2
Trade	0.3	0.3	0.6	0.6
Transportation and warehouse	0.4	0.3	0.8	0.6
Finance, insurance, real estate and leasing	0.3	0.1	0.8	0.4
Professional, scientific and technical services	0.9	0.5	1.4	0.9
Business, building and other support services	0.6	0.4	1.4	0.9
Information, cultural and recreation	0.6	0.4	1.0	0.7
Accomodation and food services	0.6	0.7	0.9	0.9
Other services	0.5	0.3	0.8	0.5

1. Employed outside public services in firms with at least two employees.
Source: Statistics Canada, Business and Labour Market Analysis Division, the Longitudinal Worker File.

Table 3 Estimated number of displaced workers aged 25 to 49, by seniority, 1988 to 2002[1]

Workers displaced through firm closures

	Men		Women	
	All	With at least 5 years of seniority	All	With at least 5 years of seniority
1988	30,220	1,980	13,890	960
1989	31,230	1,480	14,680	980
1990	43,660	3,130	18,310	1,470
1991	31,550	3,420	15,400	1,410
1992	35,060	3,200	15,380	1,730
1993	27,250	2,740	12,360	1,200
1994	27,640	2,820	12,590	1,310
1995	28,030	2,270	12,910	1,440
1996	28,370	2,500	13,190	1,600
1997	29,200	2,090	13,950	1,580
1998	29,720	2,450	14,630	1,870
1999	25,840	2,380	15,210	1,680
2000	26,410	2,580	15,830	1,830
2001	26,940	2,590	14,160	1,460
2002	23,090	2,340	11,380	1,400

Workers displaced through firm closures or mass layoffs

	Men		Women	
	All	With at least 5 years of seniority	All	With at least 5 years of seniority
1988	60,441	10,820	19,446	2,570
1989	58,560	3,860	20,548	1,870
1990	87,320	9,440	30,523	3,150
1991	90,697	10,620	30,794	4,590
1992	93,503	13,030	30,767	4,860
1993	66,187	8,830	24,714	4,400
1994	63,184	7,410	28,328	3,800
1995	56,061	6,370	25,821	3,550
1996	52,682	7,650	26,372	3,900
1997	45,883	5,460	24,405	4,100
1998	55,186	6,010	25,610	4,390
1999	47,379	5,890	26,625	4,250
2000	48,482	5,880	23,783	3,840
2001	69,273	8,920	31,149	4,030
2002	50,025	6,070	22,769	3,530

1. Employed outside public services in firms with at least two employees.

Source: Statistics Canada, Business and Labour Market Analysis Division, the Longitudinal Worker File.

Table 4 Selected characteristics, in 1987, of high-seniority workers displaced through firm closures between 1988 and 1997

	Displaced workers		Comparison group
	Narrow sample	Broad sample	
Men			
Age			
Mean	31	31	32
Median	31	31	32
10th percentile	22	22	26
90th percentile	41	41	38
Annual earnings (in 2000$)			
Mean	31,989	32,060	45,880
Median	31,060	30,947	45,153
10th percentile	10,125	9,836	25,794
90th percentile	53,053	53,643	66,452
Sample size (persons)			
Positive earnings in 1987	1,795	2,157	87,583
Used for regression analysis	1,828	2,196	87,583
	Displaced workers		**Comparison group**
	Narrow sample	Broad sample	
Women			
Age			
Mean	33	32	32
Median	33	32	32
10th percentile	22	23	25
90th percentile	42	42	38
Annual earnings (in 2000$)			
Mean	18,958	18,629	31,152
Median	18,061	17,650	29,924
10th percentile	4,689	4,456	13,541
90th percentile	32,632	32,492	49,607
Sample size (persons)			
Positive earnings in 1987	807	1,021	73,780
Used for regression analysis	844	1,068	73,780

Source: Statistics Canada, Business and Labour Market Analysis Division, the Longitudinal Worker File.

Table 5 Earnings losses (in 2000$) of high-seniority workers displaced through firm closures[1]

Fixed-effects models

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	-5	206	-53	-18
	(298)	(292)	(316)	(277)
2 years before	-459	-325	-665	-838
	(332)	(316)	(345)	(315)
1 year before	-1,895	-1,847	-1,524	-1,880
	(348)	(334)	(368)	(337)
Year of displacement	-9,047	-9,823	-7,059	-7,845
	(407)	(394)	(433)	(396)
1 year after	-10,707	-14,407	-8,591	-11,531
	(443)	(472)	(468)	(458)
2 years after	-8,121	-11,987	-6,485	-9,527
	(439)	(474)	(467)	(458)
3 years after	-7,487	-10,837	-6,404	-9,163
	(442)	(463)	(453)	(446)
4 years after	-7,035	-10,024	-6,011	-8,307
	(452)	(466)	(477)	(456)
5 years after	-6,618	-8,506	-5,751	-7,542
	(473)	(464)	(496)	(462)

Models with worker-specific trends

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	-1,614	-1,559	-240	-266
	(334)	(309)	(286)	(248)
2 years before	-2,726	-2,680	-883	-1,132
	(501)	(458)	(412)	(366)
1 year before	-4,254	-4,305	-1,604	-2,029
	(656)	(605)	(533)	(479)
Year of displacement	-11,816	-12,596	-7,061	-7,947
	(844)	(784)	(705)	(658)
1 year after	-13,409	-17,143	-8,322	-11,457
	(1001)	(948)	(863)	(829)
2 years after	-10,810	-14,738	-5,975	-9,306
	(1159)	(1099)	(993)	(948)
3 years after	-10,218	-13,656	-5,684	-8,824
	(1323)	(1241)	(1096)	(1054)
4 years after	-9,864	-12,964	-5,112	-7,879
	(1478)	(1383)	(1243)	(1184)
5 years after	-9,599	-11,619	-4,703	-7,055
	(1650)	(1539)	(1383)	(1307)

1. Standard errors, adjusted for the clustering of observations by individuals, are between parentheses.

Source: Authors' calculations based on data from the Longitudinal Worker File.

Table 6 Long-term earnings losses (in 2000$) of high-seniority workers displaced through firm closures – Various subgroups

	Men		Women	
	Narrow sample	Broad sample	Narrow sample	Broad sample
Aged 25 to 34				
Fixed-effects models	-5,410	-7,327	-4,818	-6,323
	[-18.2]	[-24.9]	[-25.4]	[-32.7]
Models with trends	-11,260	-13,126	**-3,958**	-5,340
	[-37.8]	[-44.5]	[-20.9]	[-27.6]
Aged 35 to 49				
Fixed-effects models	-6,572	-8,518	-5,428	-7,420
	[-17.3]	[-22.1]	[-26.0]	[-35.4]
Models with trends	-7,873	10,005	-4,037	-6,749
	[-20.7]	[-25.9]	[-19.3]	[-32.2]
Employed in manufacturing				
Fixed-effects models	-7,762	-9,323	-6,107	-7,993
	[-23.1]	[-28.1]	[-29.9]	[-39.5]
Models with trends	-11,112	-13,919	-8,385	-10,428
	[-33.1]	[-42.0]	[-41.1]	[-51.5]
Employed outside manufacturing				
Fixed-effects models	-6,303	-8,323	-5,245	-6,873
	[-18.0]	[-23.4]	[-26.1]	[-33.6]
Models with trends	-10,460	-12,261	-5,012	-7,459
	[-29.9]	[-34.4]	[-24.9]	[-36.5]
Employed in firms with <=100 employees				
Fixed-effects models	-6,252	-8,017	-5,339	-7,001
	[-18.4]	[-23.5]	[-26.9]	[-35.2]
Models with trends	-8,514	-10,719	-5,461	-7,713
	[-25.0]	[-31.4]	[-27.5]	[-38.8]
Employed in firms with >100 employees				
Fixed-effects models	-4,664	-6,484	-5,378	-7,304
	[-12.8]	[-17.4]	[-25.1]	[-33.2]
Models with trends	-13,762	-15,142	**-3,479**	-5,884
	[-37.7]	[-40.7]	[-16.3]	[-26.7]

Notes: Numbers in brackets show the percentage of pre-displacement earnings that earnings losses in year t+5 amount to. Losses are statistically significant at the 5% level (two-tailed test), except those in bold. All regressions account for the clustering of observations by individuals.

Source: Authors' calculations based on data from the Longitudinal Worker File.

Table 7 Earnings losses (in 2000$) of Canadian workers displaced through firm closures – No seniority restrictions[1]

Fixed-effects models

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	-837	-840	-1,163	-998
	(236)	(213)	(224)	(196)
2 years before	-947	-1,106	-2,404	-2,325
	(268)	(243)	(248)	(223)
1 year before	-449	-679	-2,125	-2,121
	(279)	(253)	(255)	(230)
Year of displacement	-5,240	-6,029	-6,037	-6,497
	(284)	(260)	(263)	(239)
1 year after	-7,430	-8,513	-6,993	-7,723
	(278)	(259)	(275)	(252)
2 years after	-5,243	-7,046	-4,999	-6,304
	(282)	(267)	(281)	(260)
3 years after	-4,960	-6,761	-4,783	-6,065
	(284)	(268)	(281)	(260)
4 years after	-4,538	-6,191	-4,393	-5,650
	(295)	(276)	(289)	(267)
5 years after	-4,453	-6,185	-4,252	-5,714
	(310)	(286)	(300)	(272)

Models with worker-specific trends

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	-215	-144	-173	-98
	(261)	(236)	(233)	(206)
2 years before	27	-40	-747	-760
	(379)	(344)	(328)	(296)
1 year before	1,205	1,098	-59	-141
	(488)	(445)	(413)	(378)
Year of displacement	-3,225	-3,879	-3,716	-4,276
	(595)	(545)	(507)	(471)
1 year after	-4,611	-5,725	-4,308	-5,099
	(695)	(642)	(607)	(569)
2 years after	-1,665	-3,152	-1,977	-2,960
	(804)	(746)	(698)	(657)
3 years after	-669	-2,032	-1,449	-2,270
	(915)	(850)	(794)	(751)
4 years after	419	-659	-775	-1,410
	(1029)	(958)	(895)	(848)
5 years after	1,123	494	-375	-841
	(1148)	(1068)	(996)	(943)

1. Standard errors, adjusted for the clustering of observations by individuals, are between parentheses.

Source: Authors' calculations based on data from the Longitudinal Worker File.

Table 8 Earnings losses (in 2000$) of high-seniority workers displaced through firm closures or mass layoffs[1]

Fixed-effects models

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	466	588	-165	-92
	(183)	(169)	(213)	(181)
2 years before	-445	-331	-831	-1,076
	(215)	(195)	(227)	(199)
1 year before	-2,122	-2,014	-1,803	-2,131
	(222)	(202)	(236)	(207)
Year of displacement	-10,461	-11,654	-7,939	-8,774
	(259)	(243)	(293)	(260)
1 year after	-12,555	-17,584	-9,742	-13,479
	(289)	(292)	(330)	(311)
2 years after	-10,167	-15,007	-7,241	-10,955
	(277)	(283)	(322)	(310)
3 years after	-8,183	-12,609	-6,536	-9,731
	(283)	(285)	(322)	(309)
4 years after	-8,228	-11,788	-6,314	-8,868
	(289)	(284)	(333)	(310)
5 years after	-7,119	-9,732	-6,052	-7,983
	(294)	(280)	(346)	(311)

Models with worker-specific trends

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	-1,301	-1,422	-777	-851
	(210)	(186)	(237)	(201)
2 years before	-2,774	-2,917	-1,425	-1,848
	(324)	(284)	(327)	(281)
1 year before	-4,643	-4,747	-2,317	-2,820
	(422)	(375)	(420)	(363)
Year of displacement	-12,968	-14,198	-8,456	-9,464
	(542)	(489)	(550)	(483)
1 year after	-15,221	-20,348	-9,999	-14,009
	(652)	(600)	(663)	(597)
2 years after	-13,038	-18,028	-7,258	-11,348
	(740)	(681)	(753)	(681)
3 years after	-11,306	-15,925	-6,338	-10,009
	(842)	(772)	(845)	(765)
4 years after	-11,648	-15,435	-5,929	-9,053
	(948)	(868)	(950)	(854)
5 years after	-10,883	-13,747	-5,505	-8,096
	(1051)	(960)	(1056)	(940)

1. Standard errors, adjusted for the clustering of observations by individuals, are between parentheses.

Source: Authors' calculations based on data from the Longitudinal Worker File.

Table 9 Long-term earnings losses (in 2000$) of high-seniority workers displaced through firm closures or mass layoffs – Various subgroups

	Men		Women	
	Narrow sample	Broad sample	Narrow sample	Broad sample
Aged 25 to 34				
Fixed-effects models	-6,398	-9,483	-4,687	-6,604
	[-18.8]	[-28.0]	[-21.5]	[-30.4]
Models with trends	-14,405	-17,188	-8,737	-11,098
	[-42.3]	[-50.7]	[-40.2]	[-51.1]
Aged 35 to 49				
Fixed-effects models	-7,212	-10,076	-6,164	-8,302
	[-16.8]	[-23.5]	[-25.6]	[-34.8]
Models with trends	-8,526	-11,432	-2,577	-5,304
	[-19.9]	[-26.7]	[-10.7]	[-22.3]
Employed in manufacturing				
Fixed-effects models	-7,714	-10,294	-7,267	-8,604
	[-20.3]	[-27.4]	[-32.2]	[-38.7]
Models with trends	-11,717	-15,200	-7,065	-9,110
	[-30.9]	[-40.5]	[-31.3]	[-41.0]
Employed outside manufacturing				
Fixed-effects models	-6,908	-9,260	-5,218	-7,099
	[-17.3]	[-23.2]	[-22.1]	[-30.2]
Models with trends	-11,879	-14,143	-5,597	-8,104
	[-29.8]	[-35.4]	[-23.8]	[-34.5]
Employed in firms with <=100 employees				
Fixed-effects models	-7,126	-8,816	-5,350	-7,230
	[-19.3]	[-23.9]	[-25.7]	[-34.9]
Models with trends	-10,755	-12,921	-5,302	-8,312
	[-29.1]	[-35.1]	[-25.5]	[-40.1]
Employed in firms with >100 employees				
Fixed-effects models	-6,199	-10,209	-6,528	-8,514
	[-14.9]	[-24.6]	[-25.0]	[-33.1]
Models with trends	-9,067	-12,923	-5,744	-7,619
	[-21.7]	[-31.1]	[-22.0]	[-29.6]

Notes: Numbers in brackets show the percentage of pre-displacement earnings that earnings losses in year t+5 amount to. Losses are statistically significant at the 5% level (two-tailed test). All regressions account for the clustering of observations by individuals.

Source: Authors' calculations based on data from the Longitudinal Worker File.

Table 10 Earnings losses of Canadian workers displaced through firm closures or mass layoffs – No seniority restrictions[1]

Fixed-effects models

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	-49	91	-645	-469
	(152)	(138)	(163)	(142)
2 years before	-442	-409	-1,586	-1,506
	(173)	(157)	(178)	(160)
1 year before	-596	-568	-1,619	-1,674
	(179)	(163)	(188)	(167)
Year of displacement	-6,949	-7,879	-6,406	-7,075
	(189)	(176)	(201)	(182)
1 year after	-9,041	-12,884	-7,522	-10,581
	(198)	(196)	(218)	(208)
2 years after	-6,822	-10,799	-5,193	-8,445
	(198)	(196)	(219)	(210)
3 years after	-5,615	-9,345	-4,587	-7,519
	(200)	(197)	(221)	(211)
4 years after	-5,309	-8,391	-4,177	-6,665
	(207)	(200)	(227)	(213)
5 years after	-4,819	-6,867	-3,975	-5,796
	(215)	(201)	(238)	(215)

Models with worker-specific trends

	Men		Women	
Displacement variables	**Narrow sample**	**Broad sample**	**Narrow sample**	**Broad sample**
3 years before	-115	-80	-372	-271
	(177)	(157)	(178)	(153)
2 years before	-381	-405	-915	-881
	(262)	(234)	(256)	(223)
1 year before	-203	-185	-712	-759
	(339)	(306)	(329)	(288)
Year of displacement	-6,288	-7,138	-5,469	-6,081
	(423)	(385)	(410)	(361)
1 year after	-8,036	-11,897	-6,393	-9,432
	(503)	(463)	(492)	(440)
2 years after	-5,510	-9,581	-3,886	-7,153
	(581)	(535)	(566)	(507)
3 years after	-4,028	-7,911	-3,125	-6,097
	(663)	(609)	(644)	(575)
4 years after	-3,480	-6,757	-2,579	-5,123
	(749)	(689)	(723)	(645)
5 years after	-2,782	-5,048	-2,262	-4,147
	(833)	(766)	(807)	(717)

1. Standard errors, adjusted for the clustering of observations by individuals, are between parentheses.

Source: Authors' calculations based on data from the Longitudinal Worker File.

Table 11 Long-term earnings losses as a percentage of pre-displacement earnings – Summary

Definition of displacement:	Firm closures		Firm closures or mass layoffs	
Econometric model	**Fixed-effects**	**Trends**	**Fixed-effects**	**Trends**
	percentage			
Men				
Narrow sub-sample				
All displaced workers	-16	4[1]	-15	-9
High-seniority displaced workers	-19	-28	-18	-28
Broad sub-sample				
All displaced workers	-22	2[1]	-22	-16
High-seniority displaced workers	-25	-34	-25	-35
Women				
Narrow sub-sample				
All displaced workers	-25	-2[1]	-21	-12
High-seniority displaced workers	-29	-23	-26	-24
Broad sub-sample				
All displaced workers	-34	-5[1]	-31	-22
High-seniority displaced workers	-37	-35	-35	-35

1. Number is based on parameter estimates that are not statistically significant at the 5% level (two-tailed test).
Source: Authors' calculations based on data from the Longitudinal Worker File.

Appendix

Table 1a Displacement rates and permanent layoff rates of workers aged 50 to 64,[1] 1988 to 2002

	Men			Women		
	Permanent layoff rates	Displacement rates due to:		Permanent layoff rates	Displacement rates due to:	
		Firm closures	Firm closures + mass layoffs		Firm closures	Firm closures + mass layoffs
	percentage					
1988	7.1	0.7	1.6	4.4	0.5	0.8
1989	6.8	0.7	1.5	4.1	0.5	0.8
1990	7.9	1.0	2.3	4.9	0.7	1.1
1991	8.2	0.8	2.6	5.0	0.6	1.1
1992	7.9	0.8	2.6	5.1	0.6	1.3
1993	7.5	0.7	1.9	4.6	0.5	1.0
1994	7.1	0.7	1.8	4.2	0.4	0.9
1995	7.1	0.6	1.7	3.8	0.4	0.8
1996	6.7	0.6	1.4	3.7	0.4	0.7
1997	6.6	0.6	1.1	3.6	0.5	0.7
1998	6.5	0.6	1.1	3.4	0.4	0.7
1999	6.0	0.5	1.1	3.0	0.4	0.7
2000	5.9	0.5	1.1	3.7	0.4	0.6
2001	7.4	0.6	1.7	4.6	0.5	1.0
2002	7.1	0.6	1.3	4.4	0.4	0.9

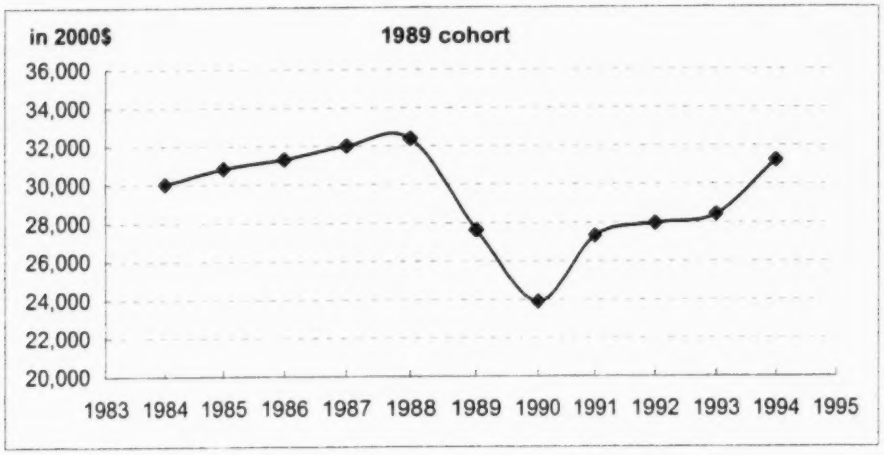
Table 1b Estimated number of workers displaced or permanently laid-off, aged 50 to 64[1], 1988 to 2002

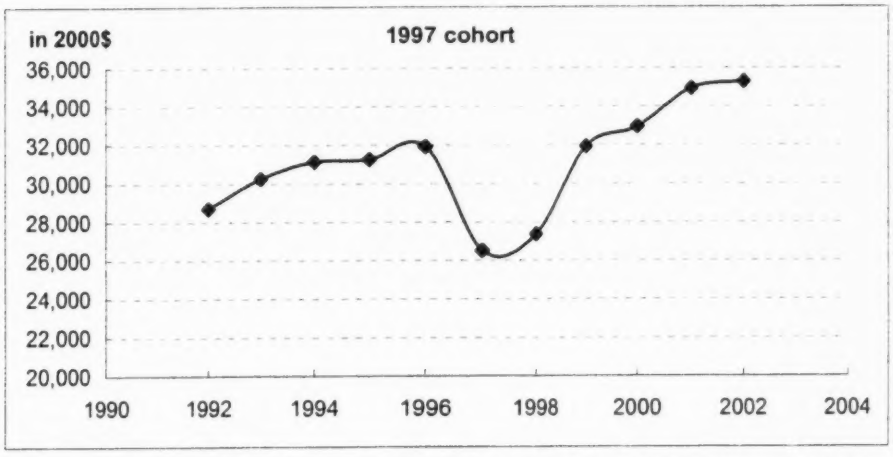
	Men			Women		
	Permanently laid-off	Displaced due to:		Permanently laid-off	Displaced due to:	
		Firm closures	Firm closures + mass layoffs		Firm closures	Firm closures + mass layoffs
1988	57,280	5,650	12,908	19,100	2,170	3,472
1989	55,070	5,670	12,148	18,830	2,300	3,674
1990	64,750	8,200	18,852	23,640	3,380	5,308
1991	66,890	6,530	21,210	24,660	2,960	5,426
1992	64,110	6,490	21,102	25,910	3,050	6,605
1993	61,530	5,740	15,587	24,070	2,620	5,233
1994	59,740	5,890	15,144	22,940	2,180	4,915
1995	62,150	5,250	14,882	22,030	2,320	4,637
1996	62,320	5,580	13,023	23,430	2,530	4,434
1997	67,160	6,110	11,193	26,190	3,640	5,092
1998	71,740	6,620	12,141	28,100	3,310	5,784
1999	71,240	5,940	13,060	27,960	3,730	6,524
2000	75,660	6,410	14,121	38,610	4,170	6,275
2001	80,290	6,510	18,445	31,480	3,420	6,845
2002	80,420	6,800	14,726	32,110	2,920	6,568

1. Employed outside public services in firms with at least two employees.

Source: Statistics Canada, Business and Labour Market Analysis Division, the Longitudinal Worker File.

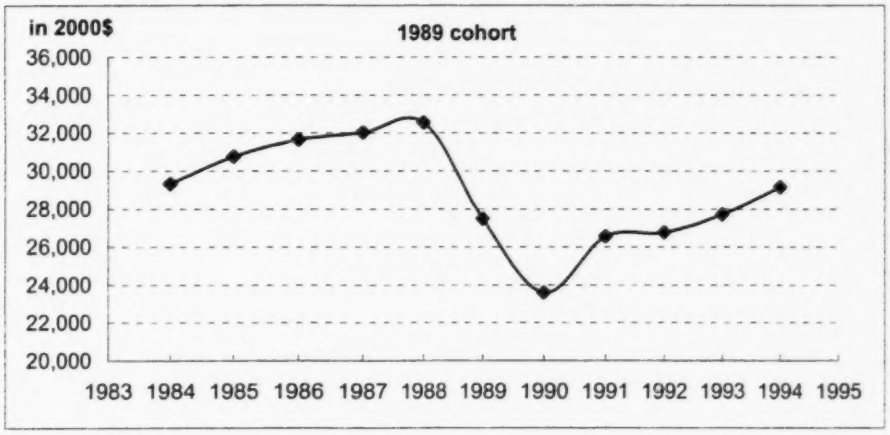
Figure 1 Earnings trajectories of high-seniority males displaced through firm closures - Narrow sub-sample in 1989 and 1997

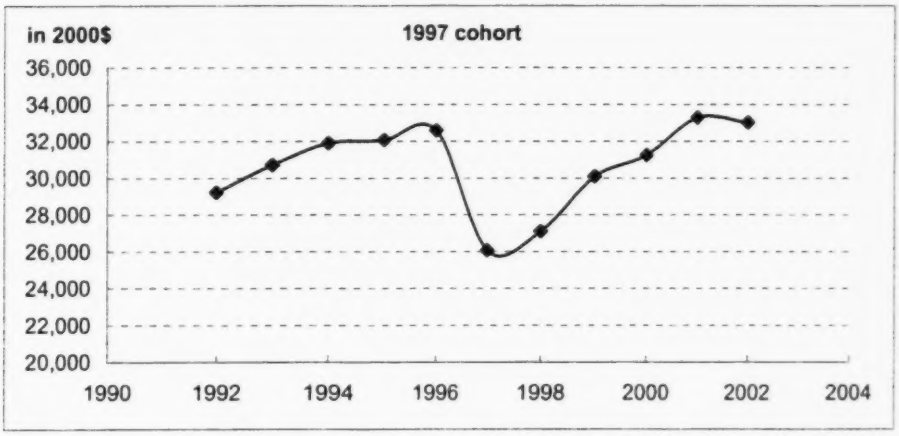




Source: Statistics Canada, Business and Labour Market Analysis Division, the Longitudinal Worker File.

Figure 2 Earnings trajectories of high-seniority males displaced through firm closures – Broad sub-sample in 1989 and 1997





Source: Statistics Canada, Business and Labour Market Analysis Division, the Longitudinal Worker File.

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